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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/558,541	02/15/2007	John E. O'Gara	60005US(49991)	6426
48990      7590      08/10/2010 EDWARDS ANGELL PALMER & DODGE LLP P.O. BOX 55874 BOSTON, MA 02205				
EXAMINER BAUMSTEIN, KYLE				
ART UNIT		PAPER NUMBER		
1796				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/558,541

**Applicant(s)**

O'GARA ET AL.

**Examiner**

KYLE BAUMSTEIN

**Art Unit**

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 May 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-52, 106, 107, 182, 183, 194, 195 and 246-251 is/are pending in the application.
- 4a) Of the above claim(s) 106, 107, 246, 247, 250 and 251 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-38, 40, 44-49, 51, 52, 182, 183, 195, 248 and 249 is/are rejected.
- 7) ☒ Claim(s) 39, 41-43 and 50 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-27, 52, and 248 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaya et al. (US Pat. 5650474).

Yamaya teaches a process for preparing organic functional group-containing organopolysiloxanes. The invented composition can have the following structure:

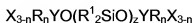


wherein Y represents an organic group selected from a group including (meth)acryloxy groups and  $R^1$  represents a hydrocarbon group (col. 7, line 29-50). Compounds having (meth)acryloxy groups are preferred due to their high reactivity.  $\gamma$ -methacryloxypropyltrimethoxysilane (analogous to the instantly claimed (3-methacryloxypropyl) trimethoxysilane) is included in the list of suitable (meth)acryloxy group-containing compounds (col. 12, line 39-51). Also, in order to further modify the organopolysiloxanes, organic functional group-free alkoxysilanes may be added. Tetraalkoxysilanes, including tetramethoxysilane and tetraethoxysilane, are cited as suitable alkoxysilanes to be used (col. 12, line 58-col. 13, line 20). The reaction of these compounds to prepare the invented composition reads on the instantly claimed composition. Another embodiment of the invented composition comprises the

aforementioned formula wherein Y represents a polymer moiety having aromatic vinyl recurring units (col. 19, line 25-67). Such a composition reads on the composition of instant claim 25. Regarding claims 2-13, the only element required by claim 1, upon which these claims are dependent, is the hybrid composition. Therefore, any claims directed to the second material are met by any reference that teaches a hybrid composition that is capable of interacting with a second material. Also, regarding claim 248, the limitations of the claim are product-by-process limitations. Therefore, any polymer composition that reads on the composition of the instant claim meets the limitations, regardless of the method used to prepare it. Although many compositions are disclosed in the reference, it has been held that the mere fact that the reference suggests a multitude of possible combinations does not in and of itself make any one of these combination less obvious (*Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir. 1989)). Therefore, it would have been obvious to one having ordinary skill in the art to have prepared a composition as claimed in the instant application from the disclosure of the invented composition.

Claims 28-36, 52 and 249 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berg et al. (US Pat. 5895794).

Berg teaches shelf stable crosslinked emulsions comprising a polysiloxane capable of crosslinking via condensation, addition, or free radical reactions. The siloxane polymers are described by the following formula:



wherein X can be a vinyl group, Y is a silicone atom, R is a substituted or unsubstituted alkyl group, and R<sup>1</sup> is selected from a group including X and aromatic or aliphatic carbon groups (col. 5, line 10-26). Upon polymerization of the vinyl functional groups, a structure resembling the instantly claimed polymerized scaffolding nanocomposite is produced. The invented composition also comprises a surfactant, of which the most preferred embodiments are nonionic surfactants. Pluronic F38 is included in the list of suitable nonionic surfactants (col. 7, line 34-65). Although the reference does not mention the hydrophile-lipophile balance of Pluronic F38, it is assumed that since the instant application has a clear preference for the compound that it exhibits the instantly claimed HLB of about 33. While the reference does not explicitly disclose the modification of pore size due to the addition of the surfactant, it is assumed that adding a surfactant to a composition that is substantially similar to that as is claimed in the instant application will have the same pore structure modification effect. Although many compositions are disclosed in the reference, it has been held that the mere fact that the reference suggests a multitude of possible combinations does not in and of itself make any one of these combination less obvious (*Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir. 1989)). Therefore, it would have been obvious to one having ordinary skill in the art to have prepared a composition as claimed in the instant application from the disclosure of the invented composition. Furthermore, the composition taught by Berg, comprising the aforementioned polymer comprising the vinyl group-containing silane compound reads on the instantly claimed polymerized scaffolding nanocomposite wherein the polymerized vinyl groups read on the organic

portion that is surrounded by the condensation polymerized siloxane that reads on the inorganic portion.

Claims 38, 40, 44-49, and 51 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaya et al. (US Pat. 5650474) as applied to claims 2-27, 52, and 248 above, and further in view of Jiang et al. (US PGPub 2002/0070168).

Yamaya teaches the aforementioned organopolysiloxane. The composition has been shown to be analogous to that which is claimed in the instant application. However, the reference makes no mention of the use of compounds to modify the surface of the invented composition.

Jiang teaches porous inorganic/organic hybrid particles. The invented particles are prepared by polymerizing one or more organoalkoxysilane and a tetraalkoxysilane (col. 9, line 60-col. 10, line 1). Therefore, the composition will have a similar structure as that which is taught by Yamaya and will inevitably have the same functional groups. The surface of the particle taught by Jiang is modified by reacting with a reagent that is reactive towards the aforementioned functional groups. Vinyl groups can be reacted with a variety of reagents including propagating polymer radical centers (col. 11, line 52-58), which reads on the instantly claimed polymeric coating surface modifier. The surface of the invented particles can also be surface modified with a compound having the following general structure:



wherein Z is Cl, Br, I, C<sub>1</sub>-C<sub>5</sub> alkoxy, dialkylamino, or trifluoromethanesulfonate; a and b are an integer from 0 to 3, R' is an alkyl group; and R is a functionalizing group selected from alkyl, alkenyl, and aryl among others (col. 12, line 19-30). Octadecyltrichlorosilane is given as a preferred embodiment of the surface modifier (col. 12, line 45). Being that the composition taught by Yamaya has the same functional groups as that which is taught by Jiang, it would have been obvious to have used any of these surface modifiers to modify the invented composition, providing it with the desired functional group.

Claims 182, 183, 194, and 195 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller et al. (PCT/EP01/00604).

USPGPub. 2003/0021730 is used as an English language equivalent of the European patent document.

Mueller teaches a monolithic frit for a capillary column, preferably a fused-silica capillary column. The column comprises a directly polymerized-in frit. Prior to polymerization, the inner wall of the column is functionalized with a reactive group, such as silanol (§ 0028). Following this functionalization, methacryloxypropyltrimethoxysilane can be added to provide added functional groups. The reference discloses that it is known to prepare monoliths of polyacrylate materials inside such columns (§ 0039). The polymerization of polyacrylate materials inside a silica column that has been functionalized with methacryloxypropyltrimethoxysilane clearly reads on the instantly claimed polymerized scaffolding nanocomposite. While the inner diameter of the

column is not generically disclosed, example 1 cites the use of a column having an I.D. of 200  $\mu\text{m}$ . Although many compositions are disclosed in the reference, it has been held that the mere fact that the reference suggests a multitude of possible combinations does not in and of itself make any one of these combination less obvious (*Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir. 1989)). Therefore, it would have been obvious to one having ordinary skill in the art to have prepared a composition as claimed in the instant application from the disclosure of the invented composition.

#### ***Allowable Subject Matter***

Claims 39, 41, 42, 43, and 50 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Response to Arguments***

Applicant's arguments filed 5/26/2010 have been fully considered but they are not persuasive. Applicants argue that the composition invented by Yamaya is not analogous to that as is claimed in the instant application because the invention does not teach the instantly claimed monolithic material or the polymerized scaffolding nanocomposite. Applicants also argue that the structure taught by Mueller does not read on the instantly claimed structure because Mueller does not teach the instantly

claimed polymerized scaffolding nanocomposite. The Office respectfully disagrees for the following reasons.

Yamaya teaches the aforementioned polymerized vinyl functional group-containing alkoxy silane composition. Applicants argue that the invented composition does not disclose porous monolithic materials. However, the instant specification defines such materials as a porous three-dimensional material having a continuous interconnected pore structure in a single piece. While the definition given in the specification is intended to differentiate between a collection of individual particles packed into a bed formation, the definition does not exclude the presence of the composition as a single particle. Therefore, being that the particulate material invented by Yamaya has the same structure as is claimed in the instant application, the particles themselves do in fact read on the instantly claimed porous monolithic materials. Also, applicants' contention that the composition taught by Yamaya is a material having an average compositional formula and is not analogous to the instantly claimed polymerized scaffolding nanocomposites. The instant specification defines said nanocomposites as a polymerized organic nanophase surrounded by a polymerized inorganic nanophase. The instant claims describe such compositions as being the reaction product of an organosilane, such as a vinyl-functionalized alkoxy silane, and a tetraalkoxy silane. Being that Yamaya clearly discloses compositions comprising the reaction products of these very same components, the Examiner maintains that the invented compositions do read on the instantly claimed composition.

Applicants' argument that the structure disclosed by Mueller does not read on the instantly claimed PSN material is not convincing. As is stated above, the polymerization of methacryloxypropyltrimethoxysilane in the column that has been functionalized with silanol groups clearly reads on the instantly claimed separations device comprising. The polymerized siloxane and methacrylate groups read on the instantly disclosed inorganic and organic nanophases, respectively.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KYLE BAUMSTEIN whose telephone number is (571)270-5467. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Margaret G. Moore/  
Primary Examiner, Art Unit 1796

/KBB/